THE

AGRICULTURAL MUSEUM.

OMNIS FERET OMNIA TELLUS. VIRG.

Vol. I.] *Georgetown, Ca. Feb.* 20, 1811. [No. 17.

FROM THE AURORA.

Manufacture of Gunpowder.

The improvement in the manufacture of gun powder, in the United States, has exceeded all calculation. Some time since, it was an opinion generally entertained, that the Americans could not prepare gun powder equal to the French or English. This idea appeared more plausible from the circumstance, that so many able and celebrated chymists of Europe, devoted their time and talents in researches of this kind. Experiments after experiments were almost daily instituted, for the purpose of determining the best mode of refining, or preparing the nitre, sulphur, and charcoal.

The Americans have, however, with a zeal becoming the character which they so deservedly bear, improved the several parts of the process—in the purification of the nitre and sulphur— in the carbonization of wood in iron cylinders, and in the proper proportion and mixture of the ingredients. The result of these researches it may with justice be said, has far exceeded our most sanguine expectations. And, indeed, the extent of improvement in this country, of which the arts and manufactures generally are susceptible, is beyond comparison. Are we not called to witness, on numerous occasions, the superiority of American fabrics over those of foreign import?

The salt petre refined at the powder mills of Frankford, under the direction of a celebrated artist, Mr. Munns, when chymically examined, and compared with the best London refined salt petre, far exceeded it in purity. The gun powder prepared from it, projected a ball considerably farther, under the same circumstances,

than the best English, and was equal in all respects, to the French This fact I know to be true. The gun powder manufactured by Mr. Dupont will also have this effect.

From the knowledge I possess of the process of refining salt petre, and of the directions uniformly given by chymical writers, I am convinced, that the mode employed at the Frankford mills,* in several important parts, is entirelydifferent from that generally made use of.

In considering so useful a branch of manufacture as that of gun powder, a circumstance is worthy of remark, *namely*, the mode of obtaining nitre from our own resources.

This object, we are well assured, was the primary consideration of the congress of '76; and the numerous essays and pamphlets, which were published at that time, were of immense service to the country in detailing the different modes of preparing nitre. To no one can these reflections be more obvious, than to the gun powder manufacturer; and to no one can they be more really serviceable. Did not the French, according to accounts when this article was extremely scarce, invent every method to obtain it in their country? and did they not succeed? They had no nitre pits; of which our western country abounds; but they had refuse vegetable and animal matter, and a number of other substances, which, when properly treated, afforded salt petre in abundance. We are, however, better situated. From what we learn relative to the nitre pits of the western country, and particularly from the remarks of Dr. Brown, we are assured, that the quantity of nitre which could be manufactured, would supply ALL the exigencies of our country Though it may be truly said, that the spirit of '76 led the genius of Columbia to the cellars, barn yard, and earthen floors of tobacco houses, for a supply of this article, yet, in our day, the caves or caverns of the western country will render this extent of research unnecessary.

*Owned by J. H. Worrell, esq.

With respect to sulphur. Immense quantities of this article are found in a variety of situations either native or combined. But the operation of the chymist, will sever the iron chain of nature, and present it to the manufacturer in a pure state, for the purpose of his art.

Charcoal, indeed, though easily prepared for common purposes, requires a peculiar art or skill in its preparation, for the manufacture of powder. The willow, the Linden, and several other woods have been used for preparing the coal; but the first kind appears to afford a coal possessing all the desirable properties. Much, however, depends on the manipulation; and no mode is so well adapted as that of employing iron cylinders cast for the purpose.

Some useful improvements made in the *grinding*, *mixing*, and finally the *granulation*, tend amazingly to an object so desirable in gun powder. Some extensive improvements, or rather additions, on a very enlarged scale, are now preparing at the works at Frankford.

PYRO.

THE PEACH TREE.

The Peach is the most delicious fruit that can be produced in any country. Fluxes are sometimes ascribed to the use of it, but this is only where it is imprudently taken before it is ripe; for it is a well known fact, that in fluxes there is nothing so desirable to the sick person as a fully ripe peach; and few prescriptions are more beneficial in every stage of that disorder, than a ripe free stone sweet peach.

The tree of this fruit may be produced in great varieties from the stone, but the best kinds are those propagated by inoculation. This precious fruit, however, is forbidden to the slothful, the negligent, and the ignorant; for it can neither be obtained, nor preserved, but by skill and attention.

The Peach Tree is liable to three casualties, or misfortunes. The fly, which deposits its eggs near the root of

the tree; the bursting of the bark by severe frost in winter; or by the splintering off of the limbs at the forks of the tree. The gardener who wishes to have well tasted, wholesome fruit, must carefully guard against these casualties.

The early free stone is one of the finest peaches; comes most certainly to its kind from the stone. In 100 acres of this kind, there will scarcely be one sour peach.

Those who can obtain the Apricot stone will find it very advantageous to plant for stocks to inoculate upon; for although they are not absolutely free from the ravages of the fly, yet they are less frequently attacked than the peach tree. Experiments have proved, that a peach inoculated on the apricot, will grow larger and rise higher than on the peach stock.

The usefulness of good peaches, which the health of ourselves and our children enjoins us to provide, and which a kind providence has put within our reach, should urge us to our duty in taking the proper means to provide them. It has been said by a gentleman who has had the experience of three score years, "that a free use of really ripe good peaches, would add seven years to the life of every man in the state."

A MARYLAND FARMER.

From the Archives of Useful Knowledge.

On the Encouragement given to the Manufactory of Fine Cloth, by the Legislature of New-York, in a letter from R. R. Livingston, Esq.

Clermont, August 5, 1809.

SIR,

I have received your favor of the 20th July, and am much gratified to learn that the efforts of your Society for the improvement of cattle are likely to be attended with success. This state affords some very fine descendants of Bakewell's stock, and we are beginning to give attention to their extension, particularly in the western part of it, where the pastures are very fine. I

think with you, that the cattle of Europe do not degenerate here, except by neglect and not preserving the races pure—both of these evils will be remedied by the emulation which your Society will excite I am much pleased that you have found the samples of wool§ worthy the attention of the Cattle Society. I am persuaded that its quality has improved under my care, though the original stock was of the finest that could be procured in Europe. The women, who are now spinning some of it, and who spun the fleeces of my full bred sheep last year, declare that it is finer and better than it was; it certainly is more abundant. I am not surprised that your Merino wool has not yet found its price. When the supply is small and irregular, the manufacturers do not prepare the machinery necessary for its manipulation, and private families not being in the habit of working it, do not know how to wash or card it. The same process that is used for common wool, runs it into knots and spoils it entirely. The first fleeces I sold was in 1806, for till I returned from France in 1805, the sheep I sent over three years before, were neglected, and did not increase; it then fetched only one dollar for the full bred, and sixty cents for the rest of the flock, consisting of 3-4 and 1-2 bred sheep, and even then I gave a year's credit. There was then no carding mill at which it could be carded. My flock and their descendants have produced two mills with fine cards, and a third is now erecting, and my instructions have enabled private families to wash and card it with cotton cards, and in consequence of this, the wool has reached the prices I have mentioned, and instead of a year's credit to the manufacturers, they pay one half of the price down, and the residue in eight months. When as a matter of favour, I have spared small quantities to private families, as twenty or thirty pounds, they pay down the price, and some have

§ Mr. L. had sent to the Editor, two samples of his full-blooded Merino ram's wool, which were exhibited at the Cattle show, in July last.

even advanced the money to my overseer three months before the sheep were shorn, in order to secure a preference.

It may be useful to mention to you one great cause of the anxiety to have fine wool, which is now diffusing throughout this state. Our legislature have, very wisely, given a bounty of eighty dollars for the best specimens of woolen cloth, not less than thirty yards narrow cloth, wove in private families, and a higher bounty for two hundred yards made by professed manufacturers. The candidates in each county exhibit their cloth to the county court at their autumn sessions. The person to whom the prize is adjudged, has an order upon the county treasurer for the amount. The judges transmit a half of a yard of the cloth, with their certificate of the breadth and length of the piece, to the Society for useful arts, who determine which of the specimens sent them are the first, second and third best of the private claimants, and which the first and second best of those exhibited by professed manufacturers: the first in each line receives from the state treasury a piece of plate of the value of one hundred and sixty dollars, the second of one hundred dollars, and the third of eighty dollars, in addition to the county bounty. The last year, the first prize for domestic manufactured cloth was adjudged to that made from my 3-4 bred wool—that of the first quality was manufactured for my own use, and not exhibited for the prize, not having the necessary breadth. The first manufacturer's prize was taken by one to whom I sold my half bred wool, and all the state prizes have been, I believe, adjudged to cloth made from half bred Merino fleeces. This has opened the eyes of the public to this object, and excited so great an emulation among the farmers, that many are anxious to procure the wool, and I do not doubt, that at least one hundred pieces of cloth will be offered for the premiums this year.

I have had it very much at heart to render this breed of sheep common, and have accordingly published in the

newspapers, in a plain stile, several little essays on the subject, which have had all the effect I promised myself from them in this state, and the western parts of Massachusetts, beyond which they did not reach. Having (as I believe) been the first to introduce the Merino full bred into the United States, (mine having been sent from France in the spring of 1802, about three or four months before those of col. Humphrey's were sent from Spain) I feel a great interest in seeing my fellow citizens avail themselves of the advantages they present, and the rather, as they are a more hardy and thrifty race than our own, as is acknowledged by every person who sees my mixed flock of common and Merino sheep feeding together, either on dry food or on grass. If, therefore, you conceive that any thing I have communicated may contribute to this desirable end, you are perfectly at liberty to use it as you think proper. I am sorry that it is not in my power to furnish the gentleman you mention with a full bred ewe, as my whole stock of the full bred ewes at present is only twenty, and I have it in contemplation to extend my flock to about 1000 sheep. At present, including lambs, it does not amount to four hundred of the full and mixed breeds; but I am now in such a train that I shall advance very rapidly.*****

I am, sir, with esteem,
Your most obdt. humb. serv't.

ROBT. R. LIVINGSTON,

JAMES MEASE, M. D.

Remarks by the Editor of the Archives

The foregoing letter is published in the hope that the wise example exhibited by the state of New York, will be followed by every state in the Union, and especially by our own, the soils and climates of which, as has been amply proved, are admirably calculated for raising sheep, and the improvement of wool. It cannot be denied, that whatever may be the aggregate amount of individual or domestic labor, in that or other articles in our state, (and it is certainly great) Pennsylvania is

far behind New-York, Massachusetts or Connecticut, in the spirit for the propagation of Merino sheep, or for manufacturing cloths; not one complete establishment to any extent, existing in the whole state. Hitherto indeed so far from encouragement being given to improvers of wool, there has been a total indifference thereto by our legislature, which although composed of more than three fourths farmers, declined until lately to do any thing on the subject; even to afford negative aid, by a trifling tax on those worthless animals about a farm—Dogs: the whole proceeds of which, even now, in the township, in Delaware county, in which the writer's farm is situated, would not amount to a sum, equal to what he thinks some of his half blooded Merinos are fairly worth. What remuneration might be expected, if a full blooded ram, or even one of the fourth cross, were sacrificed by a cur or hound? It is to be hoped that the hint will be taken, and that every possible encouragement to the increase of our flocks, and to the extension of woollen manufactures will be afforded without delay. A small portion of the wealth of the people, cannot be distributed by their representatives, to greater profit for those from whom it is collected, than by stimulating them by premiums, to attend to an object so important as that under consideration, and by aiding and fostering the endeavors of those who have turned the public attention to this great source of Agricultural riches, and public prosperity.

On the Analysis of Soils, as connected with their Improvement. By Humphrey Davy, *Esq. F. R. S.*

From the Communications of the Board of Trade.

Continued from page 264.

IX. *Examination of the finely divided Matter of Soils, and Mode of detecting mild Lime and Magnesia.*

The finely divided matter of the soil is usually very compound in its nature; it sometimes contains all the four primitive earths of soils, as well as animal and

vegetable matter; and to ascertain the proportions of these with tolerable accuracy, is the most difficult part of the subject.

The first process to be performed, in this part of the analysis, is the exposure of the fine matter of the soil to the action of the muriatic acid. This substance should be poured upon the earthy matter in an evaporating basin, in a quantity equal to twice the weight of the earthy matter; but diluted with double its volume of water. The mixture should be often stirred, and suffered to remain for an hour or an hour and a half before it is examined.

If any carbonate of lime or of magnesia exist in the soil, they will have been dissolved in this time by the acid, which sometimes takes up likewise a little oxide of iron; but very seldom any alumine.

The fluid should be passed through a filter; the solid matter collected, washed with rain water, dried at a moderate heat, and weighed. Its loss will denote the quantity of solid matter taken up. The washings must be added to the solution, which if not sour to the taste, must be made so by the addition of fresh acid, when a little solution of common prussiate of potash must be mixed with the whole. If a blue precipitate occurs, it denotes the presence of oxide of iron, and the solution of the prusiate must be dropped in till no farther effect is produced. To ascertain its quantity, it must be collected in the same manner as other solid precipitates, and heated red; the result is oxide of iron.

Into the fluid freed from oxide of iron, a solution of neutralized carbonate of potash must be poured till all effervescence ceases in it, and till its taste and smell indicate a considerable excess of alkaline salt.

The precipitate that falls down is carbonate of lime; it must be collected on the filter, and dried at a heat below that of redness.

The remaining fluid must be boiled for a quarter of an hour, when the magnesia, if any exist, will be precipitated from it combined with carbonic acid, and its quantity to be ascertained in the same manner as that of the carbonate of lime.

If any minute proportion of alumine should, from peculiar circumstances, be dissolved by the acid, it will be found in the precipitate with the carbonate of lime, and it may be separated from it by boiling for a few minutes with soap lye, sufficient to cover the solid matter. This substance dissolves alumine without acting upon carbonate of lime.

Should the finely divided soil be sufficiently calcareous to effervesce very strongly with acids, a very simple method may be adopted for ascertaining the quantity of carbonate of lime, and one sufficiently accurate in all common cases.

Carbonate of lime, in all its states, contains a determinate proportion of carbonic acid, *i. e.* about 45 per cent. so that when the quantity of this elastic fluid, given out by any soil during the solution of its calcareous matter in an acid, is known, either in weight or measure, the quantity of carbonate of lime may be easily discovered.

When the process by diminution of weight is employed, two parts of the acid and one part of the matter of the soil must be weighed in two separate bottles, and very slowly mixed together till the effervescence ceases; the difference between their weight before and after the experiment, denotes the quantity of carbonic acid lost; for every four grains and a half of which, ten grains of carbonate of lime must be estimated.

The best method of collecting the carbonic acid, so as to discover its volume, is by pneumatic apparatus. The estimation is, for every ounce measure of carbonic acid, two grains of carbonate of lime.

X. Mode of ascertaining the Quantity of insoluble finely divided animal and vegetable Matter.

After the fine matter of the soil has been acted upon by muriatic acid, the next process is to ascertain the quantity of finely divided insoluble animal and vegetable matter that it contains.

This may be done with sufficient precision, by heating it to strong ignition in a crucible over a common fire, till no blackness remains in the mass. It should be often stirred with a metallic wire, so as to expose new surfaces continually to the air; the loss of weight that it undergoes denotes the quantity of the substance that it contains destructible by fire and air.

It is not possible to ascertain whether this substance is wholly animal or vegetable matter, or a mixture of both. When the smell emitted during the incineration is similar to that of burnt feathers, it is a certain indication of some animal matter; and a copious blue flame at the time of ignition, almost always denotes a considerable portion of vegetable matter. In cases when the experiment is needed to be very quickly performed, the destruction of the decomposible substances may be assisted by the agency of nitrate of ammoniac, which at the time of ignition may be thrown gradually upon the heated mass in the quantity of twenty grains for every hundred of residual soil. It affords the principle necessary to the combustion of the animal and vegetable matter, which it causes to be converted into elastic fluids; and it is itself at the same time decomposed and lost.

XI. Mode of separating aluminous and silicious Matter and Oxide of Iron.

The substances remaining after the decomposition of the vegetable and animal matter, are generally minute particles of earthy matter, containing usually alumine and silex with combined oxide of iron.

To separate these from each other, the solid matter should be boiled for two or three hours with sulphuric acid diluted with four times its weight of water; the quantity of the acid should be regulated by the quantity of solid residuum to be acted on, allowing for every hundred grains two drachms or one hundred and twenty grains of acid.

The substance remaining after the action of the acid, may be considered as silicious; and it must be separated and its weight ascertained, after washing and drying in the usual manner.

The alumine and the oxide of iron, if any exist, are both dissolved by the sulphuric acid; they may be separated by carbonate of ammoniac, added to excess; it throws down the alumine, and leaves the oxide of iron in solution, and this substance may be separated from the liquid by boiling.

Should any magnesia and lime have escaped solution in the muriatic acid, they will be found in the sulphuric acid; this, however, is scarcely ever the case; but the process for detecting them and ascertaining their quantities, is the same in both instances.

The method of analysis by sulphuric acid, is sufficiently precise for all usual experiments; but if very great accuracy be an object, dry carbonate of potash must be employed as the agent, and the residuum of the incineration must be heated red for a half hour, with four times its weight of this substance, in a crucible of silver, or of well baked porcelain. The mass obtained must be dissolved in the muriatic acid, and the solution evaporated till it is nearly solid; distilled water must then be added, by which the oxide of iron and all the earths, except silex, will be dissolved in combination as muriates. The silex, after the usual process of lixiviation, must be heated red; the other substances may be separated in the same manner as from the muriatic and sulphuric solutions.

This process is the one usually employed by chymical philosophers for the analysis of stones.

XII. Mode of discovering soluble animal and vegetable Matter and saline Matter.

If any saline matter, or soluble vegetable or animal matter, is suspected in the soil, it will be found in the water of lixiviation used for separating the sand.

This water must be evaporated to dryness in an appropriate dish, at a heat below its boiling point.

If the solid matter obtained is of a brown colour and inflammable, it may be considered as partly vegetable extract. If its smell, when exposed to heat, be strong and fetid, it contains animal mucilaginous or gelatinous substance; if it be white and transparent, it may be considered as principally saline matter. Nitrate of potash (nitre) or nitrate of lime, is indicated in this saline matter by its scintillating with a burning coal. Sulphate of magnesia may be detected by its bitter taste; and sulphate of potash produces no alteration in solution of carbonate of ammoniac, but precipitates solution of muriate of barytes. [*To be continued.*

For the Agricultural Museum.

REMARKS, *on the advantage of working oxen in preference to horses.*

From being in the habit, for a number of years, of working oxen, I hope to be able to give to my fellow citizens satisfactory proof of the many advantages which the Farmer may derive from adopting the use of those valuable animals. I am aware of the difficulty of overcoming deeply rooting prejudices and long fixed habits. The horse is a fine, tractable animal, and easily applicable to many valuable purposes. Nevertheless, when we take into view his first cost, either at purchase, or at

common expence in raising, and add to that the annual expence of keeping him in suitable order for labour, together with his liability to disease and other casualties, and in these respects, place him in competition with the ox, we shall find a result greatly to his disadvantage.

For example; on a farm of moderate size, four draught horses will be annually employed which cost on an average, $75 each. -	$ 300.00
Geering for four horses at 5.50 -	22.00
Annual consumption of grain for 4 horses at the rate of 3 pecks per day, or 273 bushels per annum, which taken at the average of grain in the counties contiguous to the coast, or tide waters is worth 50 cents per bushel. -	136.50
Add two and a half per cent for casualties which is equal to about - - - -	11.25
	$ 469.75
Deduct for advantage of riding horses occasionally &c. at 5 per cent. - - -	22 50
And the cost for one year of four plantation horses at a moderate calculation is. -	$ 447.25
For a trial I would propose six good oxen to do equal work with 4 horses, the oxen to cost on an average, $ 35 each - - -	$ 210.00
Geering or yoking at $ 1.50 each. -	9.00
From experience I have found that steers may be kept in good working order with but little grain, and that the whole of their keeping would cost but little more than the hay that a horse will consume over and above the grain above stated; nevertheless we will allow him to consume five bushels per annum, which for six oxen will be 30 bushels at 50 cents. -	15 00
	$ 234.00
Which deduct from the amount of one years expence for four horses - -	447.25
And there will remain in favor of the oxen a balance of - - -	$ 213.25

But to make a full and fair comparison, it must be continued for at least five years.

The first cost of four horses, will be as above		$ 300.00
Geering, at $ 5.50 each.		22.00
Grain, exclusive of hay, for five years at $ 136.50 per annum.		682.50
Add for casualties at $ 11.25 per annum.		56.25
		$ 1060.75
From which deduct, for the advantage of riding at $ 22.50 per annum for five years.	$ 112.50	
For four old horses sold at the end of five years for about $ 25 each.	100.00	
		212.50
And we have the amount of expence for four horses for five years.		$ 848.25
On the contrary, six oxen at $ 35 each.		$ 210.00
Geering at 1 5 0 each.		9.00
Grain at $ 15. each.		75.00
		$ 294.00
From which deduct the price of six old oxen, sold at the end of five years at $ 25. each.		150.00
And there will remain the cost of 5 years labour of six oxen.		$ 144.00
And that of five years labor of four horses is		848.25
Leaving in favor of the oxen a balance of.		$ 704.25

A saving on a farm, in the one article of a team, in the space of five years, of more than $700, is certainly worth our attention. It would lay in a fine stock of oxen, and discharge some of the old store debts. Let us consider our situation, fellow citizens. our forests cleared our soil exhausted, our old fields whitened w th short grass, the effect of poverty. Is it not a subject worth our consideration how to extricate ourselves. Perhaps, one of the first steps to remove this evil, is to retrench our expences.

Let us try it in the article above stated—most of the counties below the stage road in Maryland use oxen. In opposition to the use of them on farms more remote from market, some may alledge that they are not calculated to travel a long journey with the products of the country. Experience has at many times, and in many places proved the contrary to be the fact. In most or all of the eastern states, oxen draw nearly all the produce of the country to market; and in many instances a greater distance than any farmer in Maryland may ever have occasion to send his. In New England, Jersey, Pennsylvania and Delaware, oxen do a great portion of the ploughing and from habit have become equally as docile as our horses. Some here may alledge that we have them not, nor can we raise them; no, neither shall we ever be able, while we keep our fields so clear of grass by the continual culture of Indian corn, an article so necessary to the support of so many farm horses. The people in this state, are not well aware of thier exceeding bad economy, until they travel out of it, where they have an opportunity of observing the much better management of others; I should advise every young farmer, as soon as his crop is housed, to take a ride to the eastward, and on his return to purchase a good yoke of oxen. Try all things, fellow citizens, and hold fast that which may be found to be best.

Your friend,

CORN PLANTER THE YOUNGER.

P. S. Nothing has been taken into account for shoeing horses; but oxen may also be shod, especially on long journeys, as is common east of us.

PRINTED FOR AND PUBLISHED BY DAVID WILEY.

Price $ 2.50 for twenty four Numbers,

To be paid in advance.